

ABSTRACT OF THE INVENTION

In vivo imaging of disease associated tissues, including tumors and other malignant growths, infection and inflammation, is used in the discovery, screening and development of therapeutic and/or diagnostic molecular targets for intervention in the treatment of the diseases involved. *In vivo* imaging is used to detect spatial and temporal variations in the imaging features of disease associated tissues. The physical regions of the tissue that correlate with imaging features are then assessed for patterns of gene expression. The corresponding genes or gene products that are upregulated in the regions of interest are useful as therapeutic and imaging targets, with enhanced spatial and/or temporal specificity.